DOCUMENT RESUME

ED 027 387 VT 007 286

By-Edwards, Ronald K., And Others

Pilot Study to Explore the Use of an Autio-Visual Tutorial Laboratory in the Secretarial Skills Area as a Means of Updating and Improving Curriculum Offerings at the Community College Level in Michigan.

Lansing Community Coll., Mich. Dept. of Accounting and Office Programs.
Spons Agency-Michigan State Dept. of Education, Lansing. Div. of Vocational Education.
Pub Date Jun 68
Note-35p.
EDRS Price MF-$0.25 HC-$1.85
Descriptors-*Audiovisual Instruction, Community Colleges, Comparative Analysis, Control Groups, Curriculum Development, Experimental Curriculum, Experimental Groups, Individual Instruction, Instructional Innovation, Laboratory Equipment, *Multimedia Instruction, Office Machines, *Office Occupations Education, *Programed Instruction, Student Attitudes, *Teaching Methods, Typewriting

This study dealt with two skill courses, business machines, and beginning typewriting. The control groups received instruction in the traditional method. The experimental groups attended open laboratory at any time convenient to them to receive their instruction. The groups were compared on the basis of identical performance tests. Materials to instruct the experimental group included 8mm film loops with sound tracks, slides with accompanying narration on magnetic tape, timed writings or production timings on magnetic tape, and hand-out sheets explaining any preparation necessary prior to the instruction. Differences between groups at the .05 level in both beginning typing and business machines indicate that the experimental groups did learn more as measured by the final performance test. Questionnaire s indicated that students generally preferred the open laboratory method of learning over the traditional classroom method. Some of the recommendations were: (1) further research in an effort to build a completely individualized curriculum, (2) greater teacher availability by qualified teaching technicians, and (3) enrollment procedures allowing prospective students to begin a section at any time. (MM)

ED027387

AUG 6 1968 CI

LANSING COMMUNITY COLLEGE

Lansing, Michigan

AN EXPERIMENTAL PILOT STUDY TO EXPLORE THE USE OF AN AUDIO–VISUAL–TUTORIAL LABORATORY IN THE SECRETARIAL SKILLS AREA

as a means of updating and improving curriculum offerings
at the community college level in Michigan.

Principal Investigators:

Ronald K. Edwards, Director
Mildred L. Williams
Wanda W. Roderick

VT007286

Conducted at Lansing Community College in cooperation with the Michigan Department of Education, Division of Vocational Education, Lansing, Michigan

June 1968

LANSING COMMUNITY COLLEGE

Lansing, Michigan

AN EXPERIMENTAL PILOT STUDY TO EXPLORE THE USE OF AN AUDIO-VISUAL-TUTORIAL LABORATORY IN THE SECRETARIAL SKILLS AREA

as a means of updating and improving curriculum offerings at the community college level in MIchigan.

Principal Investigators:

Ronald K. Edwards, Director
Mildred L. Williams
Wanda W. Roderick

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

Conducted by the Accounting and Office Programs Department, Lansing Community College in cooperation with the Michigan Department of Education, Division of Vocational Education, Lansing, Michigan

June 1968

TABLE OF CONTENTS

	Page
FOREWORD	v
SUMMARY	vi
AN EXPERIMENTAL PILOT STUDY TO EXPLORE THE USE OF AN AUDIO-VISUAL-TUTORIAL LABORATORY IN THE SECRETARIAL SKILLS AREA	1
1. Introduction	1
2. Objectives	3
3. Procedures	4
4. Instructional Materials	5
5. The Learning Carrel	7
6. Major Findings	8
7. Student Opinions	12
8. Conclusions and Recommendations	18
BIBLIOGRAPHY	20
APPENDIX A	21
APPENDIX B	22
APPENDIX C	26
APPENDIX D	27

FOREWARD

The direct costs for the pilot experiments herein reported were partially underwritten by the Michigan State Board of Control for Vocational Education. Principal investigators, cooperating agencies, and costs are detailed in Appendix C.

This pilot study was an initial step in a long ranged plan developing a complete office education curriculum that can be learned individually according to each student's time and capabilities. It has provided an excellent opportunity to review teaching methodology and skill-building procedures. It has also provided an excellent opportunity to witness differences in student motivation, although no attempt was made to predict or evaluate these differences.

The supporting funds granted by the Division of Vocational Education Michigan Department of Education made this research possible. Without such a grant this project would have been temporarily, if not indefinitely, delayed.

SUMMARY

This pilot study dealt with two skill courses which are included in almost every Office Education curriculum--Business Machines and Beginning Typewriting. Each course was experimented with separately and a control group taught by the same teacher who prepared the materials for the experimental group was maintained for comparison purposes.

The control groups received instruction in the traditional method of attending regular classes. The experimental groups were allowed to attend an open laboratory at any time convenient to them and received their instruction through the audio-visual media. At the end of the experimental period the groups were compared on the basis of identical performance tests.

Materials to instruct the experimental group were programmed and placed on audio-visual media. Demonstrations of the various machine operation were placed on 8mm film with a sound track. Slides were made of proper letter forms, manuscripts, postal cards, etc. and an accompanying narration was placed on magnetic tape. Timings for timed writings, production timings, and skill building drills were also placed on magnetic tape. These programmed units were then placed in cartridges for use by the student in easy-to-operate equipment. A handout sheet explaining any preparations necessary prior to the instruction and the assignment to be completed afterward was prepared for each unit.

A statistical analysis of the results of the final performance tests indicated learning by the experimental groups greater than that of the control group.

It is apparent by the results of this pilot study that certain skills can be taught effectively and individually with appropriate audio-visual equipment. This conclusion led to recommendations that similar experiments be conducted in other skill and nonskill subjects.

AN EXPERIMENTAL PILOT STUDY TO EXPLORE THE USE OF AN AUDIO-VISUAL-TUTORIAL LABORATORY IN THE SECRETARIAL SKILLS AREA AS A MEANS OF UPDATING AND IMPROVING CURRICULUM OFFERINGS AT THE COMMUNITY COLLEGE LEVEL IN MICHIGAN.

1. INTRODUCTION

It has long been acclaimed at the community college level that students are accepted at various levels of skills and abilities in the office education area and taken from that point to higher levels. This statement, with various wording, is built into the philosophy of community college business departments all over the state. But a legitimate question arises after examining procedures for placing incoming students in a curriculum. Do they really mean it?

For instance, if a student enters a community college office curriculum and has already obtained half the knowledge and skill necessary for completion of a course, such as intermediate typewriting, he must still start at the beginning of the course. It has not been practical to waive half a term of work for any particular student even though he already has had that part of the training. To further complicate the matters, a student may be well qualified in the topics discussed during weeks 1, 2, 4, 6, and 7 of a particular course. He must, however, sit through those weeks in order to gain the information offered in the remaining weeks.

There is no community college curriculum development known to these investigators which will give each individual student the courses and parts

of courses that he needs for vocational competence without including many items that are repetitions to him and redundant in his formal education.

It has been said that this decade will be looked upon as a frontier for individualized instruction on an automated basis. For instance, Kreiman indicated that:

> "The 1960's will go down as the decade when self-directed instruction became a reality. Although the teaching machine is still for the most part an experimental item due to its vast appetite for complex and expensive programming, it has turned the attention of the educational world in the direction of self-instruction as an effective educational method. Complex visual aids of auditorium capacity have been supplemented by inexpensive and simple cartridge loading movie projectors using and 8mm film. Educators have adopted the individual student concept known as the study carrell. The carrell brings together all these philosophies in a workable situation."[1]

A search for evidences of practice in the areas described above has been almost fruitless. Some schools have instituted closed circuit TV, but this practice still requires restricted class scheduling. Others have utilized the language-lab approach to individualize instruction, but audio instruction alone is not universally adaptable to all courses. Iowa State has utilized motion pictures with sound, but again on a scheduled classroom basis.[2] Personal observation of some experiments by Michigan State University in silent single-concept 8mm films, and Oakland Community College's taped programmed lessons, led the investigators to the idea of 8mm single-concept sound films in cartridges as a practical solution to building a curriculum which could be equally as effective as

---

[1]"Laboratory Learning Methods and Machines", by R. Kreiman, Education, Volume 85, March, 1965, pp. 399-400.

[2]"A V Practices Among Colleges and Universities", American School and University, Volume 36, July, 1964, pp. 26-27.

classroom teaching, and yet truly individualized to meet the needs of each student. A program of this type would enable community colleges throughout the state to truly "start" the student where the various high schools left off and help him progress from that point to higher levels.

3. OBJECTIVES

A. Long Range Objectives: The ultimate goal of this project is to build an office education curriculum by preparing hundreds of short, single-concept units of instruction in each area of the program. These units will be programmed on various media including 8mm sound film, slides, and tapes, loaded in cartridges for ease of use in individual carrels with special equipment. Courses can then be designed for each student by including or omitting specific units or groups of units according to individual needs.

A further objective of this project is to make the entire curriculum, or any part of it, available to other community colleges throughout the state and nation who face the same problems of trying to adapt a rigid and restricted curriculum to the widely varying needs of individual students.

B. Immediate Objectives: The objectives of this pilot project were:

1. To develop single-concept sound film, tapes and slides which will be capable of replacing the traditional classroom instruction in Office Machines I and Beginning Typewriting courses at Lansing Community College.

2. To design and construct carrels for individual learning station.

3. To compare results obtained from the audio-visual-tutorial method of instruction with those obtained in traditional classes.

3. PROCEDURES

The business Machines I and Beginning Typewriting courses were chosen for pilot projects to explore the advantages and disadvantages of audio-visual media and materials developed for individual use in carrels. Two groups of students in each subject area were used in an attempt to determine any differences in final performance attributable to the audio-visual-tutorial laboratory learning. One group in each subject area was instructed by the traditional classroom method and represented the control groups. This class was taught by the same instructor who prepared the experimental materials. The experimental groups received their instruction from continuous-loop sound films, slides and tapes in individual carrels. They had no assigned class hour and were allowed to enter the open laboratory on an unrestricted schedule.

Assignment in either experimental or control groups was by chance. For the business machines group, each student enrolling in the course drew a slip of paper from a box during the first scheduled class period. The paper had either a "1" or "2" written on it. The "1's" were assigned to the experimental group and the "2's" remained in the regular class.

The typewriting program presented a different problem. Since there were very few students who had never had previous instruction in typewriting it was necessary to use as a control group those "pure" subjects from the previous term. While this is recognized as a possible weakness in an experimental design, it was considered more appropriate than a design with an insufficient population.

During the winter term, 1967, there was no space available to establish a learning and practice laboratory in one room. Consequently, it was necessary to set up the learning carrels for the Business Machines experiment in a room across the hall from the practice machines. The carrels and practice machines were available to students from 8 a.m. to 5 p.m. weekdays, except for the hours that classes were being conducted in the business machines room, which served as the practice area. This inconvenience was reflected on the student opinionnaires discussed later in this report.

The typewriting experimental group received instruction and practice within the same room which was open from 8:00 a.m. to 10:00 p.m. weekdays and from 9:00 a.m. to noon on Saturdays. In addition, teacher assignments were made so that an instructor was available in the room several hours each day.

Data for analysis purposes consisted of scores obtained on identical performance tests for the business machines experiment and both performance and objective tests for the typewriting experiment. Comparison was made on the mean scores and variations from the mean on each test. A t-test statistical analysis was performed to determine whether or not differences between the groups were evident with an alpha-error limit of .05.

4. INSTRUCTIONAL MATERIALS

A. Business Machines I Experiment: The Business Machines I course syllabus at Lansing Community College indicates sufficient explanation, demonstration and practice on the basic operations of three types of

business machines--the ten-key adding-listing machine, the rotary calculator, and the key-driven calculator--to provide entrance-level skills for vocational purposes.

The need for demonstrations within the instructional units prohibited the use of slides as the primary visual media and the investigators turned to moving film as the required media. The original production was filmed on 16 millimeter color film. After processing, the film was edited into separate lessons containing demonstrations of a particular machine operation and two examples of problems being completed by that operation. A review of some previous operation or technique was included in each unit after the first. Twenty-two units in all were prepared, consisting of seven units each for the 10-key adding-listing machine and the rotary calculator, and eight units for the key-driven calculator.

Duplicates of the edited 16 millimeter films were made on 8 millimeter film and a magnetic stripe added for sound. The narration was synchronized on this stripe after the units were placed in continuous-loop cartridges. The instructional units were then ready for student use in rear-screen projectors, and an assignment sheet indicating practice problems and other pertinent information for each lesson completed the materials. A list of the units and contents is provided in Appendix A.

B. Beginning Typewriting Experiment: The complete course for beginning typewriting was prepared on films, slides with tapes, tapes alone, and printed instruction units and tests. Twenty units in which demonstrations were necessary were filmed in the same manner as were the

business machine units. Fourteen units of instruction on such topics as manuscripts, postal cards, business and personal letters, etc. were prepared on slides with accompanying tapes. Taped instructions only were used for three units, and two instructional units and four test units consisted of printed sheets only.

Twenty-one additional tapes, providing skill building drills and practice timings for production work and straight copy, were also prepared for the course. These tapes were used at practice stations with portable cassette tape recorders rather than in the carrels. Handout sheets containing practice and drill assignments were also prepared for all film, slide, and tape units. A complete listing of the units is given in Appendix B.

5. THE LEARNING CARREL

The learning carrel was designed by the project director to be a spacious, efficient unit with an aesthetic quality conducive to concentration and learning. Inside dimensions provide thirty inches by forty-seven inches for the desk top work space. The outside appearance of the carrel is one of walnut sides, back, and desk top with aluminum corner posts. The inside color is light cream. The desk top may be raised for hand writing work or lowered to provide the proper height for typewriting and business machine operation.

The carrel unit, housing the projectors and tape recorder rests on a shelf above the desk top so that the screen on which the films and slides are viewed is at eye-level while seated at the carrel. It was designed

with the screen in the center which reflects the images from either the slide projector, located on the left, or the movie projector, located on the right. The sound from both the movie projector and the tape recorder is available through earphones with a single jack located beneath the screen.

Efficiency and simplicity were the primary requirements for the carrel and the unit. The equipment used was chosen for its ease of operation to prevent the complications of unnecessary gadgetry from rendering the instruction ineffective. With equipment that is easier to operate than most television sets, students indicated no problems in using it.

6. MAJOR FINDINGS

A. Business Machines I: Both groups in the business machines experiment took an identical final performance test at the conclusion of the term. The test included 29 problems to be completed on each machine, for a total of 87 problems in all. Twenty minutes were allowed on each machine to complete the problems, which covered all the machine operations taught during the term.

The number of correct answers on each test was used to compare the groups. A summary of the results is given in Table I. An analysis of variance between the group means was completed and a t ratio computed to determine whether or not the differences were significant at the .05 level of confidence.

Table I shows that the average score is about 3.08 higher for those students who received their instruction in the A.V.T. laboratory. The t ratio indicates a statistically significant difference between the groups. A t ratio in excess of 1.677 indicates differences between groups at the .05 level of confidence with 50 degrees of freedom. The experimental group, therefore, did learn more as measured by the final performance test.

TABLE I

Business Machines I Statistical Summary

	Number	Mean Score
Control Group	26	76.3076
Experimental Group	26	79.3846
t ratio	df=50	1.804

An even greater difference is noticed when the scores of those students who had received no previous exposure to business machines are analyzed separately. Table II summarizes the analysis of data of the sub-groups without prior training. A t ratio in excess of 1.706 indicates a significant difference between the groups at the .05 level of confidence with 26 degrees of freedom.

TABLE II

BUSINESS MACHINES I STATISTICAL SUMMARY

(sub-groups without prior exposure to machines)

	Number	Mean Score
Control Group	14	76.1428
Experimental Group	14	80.5714
t ratio	df=26	2.320

B. Beginning Typewriting: Two types of tests were used with typewriting groups. A performance test of straight-copy was used to measure speed and accuracy on a three-minute writing. The best score from the last four writings, each given twice during the last two weeks of the term, was used for each student. In addition, an objective-type test consisting of 100 items was given as a final exam to measure their knowledge of the typewriter and the typing rules they had studied.

The results of these tests are summarized in Tables III and IV. Table III pertains only to those students in both the experimental and control groups who had never received previous typing training. Table IV includes the scores of all students in each group. Each table gives the average, or mean, scores of the groups indicated as well as the t ratio computed by an analysis of variances between the means.

TABLE III

STATISTICAL SUMMARY OF BEGINNING TYPEWRITING

(No Previous Typing Exposure)

	N	Final Exam	3-Minute Timed Writings Speed	Errors
Control Group	9	73.111	34.55	5.67
Exp. Group	12	84.083	39.83	2.75
t-ratio	df=19	2.152	1.755	2.961

It is evident that the differences between the means of the two groups with no previous typing training is significant at the .05 level of confidence. A t-ratio in excess of 1.729 at that level with 19 degrees of freedom is sufficient justification to reject a null hypothesis that there is no differences between the groups. Based on the assumption that the groups were equal before the experiment, since neither had received prior typing training, the statistical test indicates that the A.V.T. method of learning is superior to the traditional classroom method.

The statistics in Table IV do not offer such conclusive evidence, except in the number of errors on the timed writings. The t-ratio necessary to indicate a significant difference at the .05 level of confidence with 41 degrees of freedom is 1.683.

TABLE IV

STATISTICAL SUMMARY OF BEGINNING TYPEWRITING

(With and Without Previous Typing Exposure)

	N	Final Exam	3-Minute Timed Writings Speed	Errors
Control Group	20	76.850	41.7	5.85
Exp. Group	23	82.638	40.957	2.78
t ratio	df=41	1.604	.278	3.042

7. STUDENT OPINIONS

Immediately after taking the final exam, each of the students in the experimental groups were asked to complete a questionnaire designed to measure their attitudes toward this new type of instruction. The results of this form are summarized in Table V. The form as it was used with the Typing group is shown in Appendix D. The same form with a different title was used for the Business Machines I group.

A. Business Machines I: Sixteen of the twenty-six Business Machines I students felt they learned as much or more from the A.V.T. lessons as they would have in a regular class. All but four students needed explanations beyond what was given in the films. The majority needed help from one to five times during the term. The lab technicians were asked for specific help by 18 students who needed additional assistance. Question III indicates that nineteen students felt they were as well or or better prepared to apply what they had learned than they would have been from a traditional class.

Twenty-two students enjoyed the A.V.T. method of learning as indicated in Question IX. "Freedom to schedule own time" and "Opportunity to complete lessons as fast as I wanted" were given as the most common reasons.

About three out of five students would have chosen the A.V.T. method for a subsequent course if it had been available. The reasons given were again primarily associated with scheduling freedom.

B. Beginning Typewriting: The opinionnaires of the students in the typewriting group indicated somewhat more acceptance for the A.V.T. program than did those in Business Machines I. This could probably be attributed to the fact that the program was completely housed in one room and the teacher was a little more readily available. The lab hours were also extended to provide evening hours for those students who desired them.

Only five of the twenty-three typing students felt that the traditional class was more conducive to learning, although four more were not sure. The lab technician again was the greatest source of information and additional help for these students, being used by at least twenty students.

Seventeen of the group felt that the A.V.T. program prepared them as well or better than the regular class to progress to the next lesson and to utilize their skill afterward. Twenty students indicated that they enjoyed their experience with a third of them liking it "very much." Scheduling freedom, checked by all but five students, was again seen as the most popular advantage.

Seventeen students would prefer the next course in the typing series on the A.V.T. media as opposed to only five who would prefer a regular class. One student indicated that, since he had never had a regular typing class, he was unsure of his preference.

TABLE V

SUMMARY OF STUDENT OPINIONS REGARDING A.V.T.

Business Machines I and Beginning Typewriting

Questions	Answers	Number of Responses Bus. Mach.	Typing
III. Do you think you learned as much in the AVT section as you would have in a regular section?	1. Much more in AVT	1	5
	2. A little more in AVT	4	4
	3. About the same	11	5
	4. A little more in a regular class	6	4
	5. Much more in regular class	1	1
	6. Not sure	3	4
IV. In addition to the AVT unit instruction, approximately how many times did you have need for specific help with practice problems?	1. More than 10 times	2	3
	2. About 6 through 10 times	2	3
	3. About 3 to 5 times	7	8
	4. About 1 to 3 times	11	6
	5. Not at all	4	3

Questions	Answers	Number of Responses Bus. Mach.	Typing
V. When specific help was needed, whom did you ask for it? (Check more than one if applicable)	1. The instructor	1	4
	2. The lab technician	18	20
	3. Classmates	14	4
	4. No help needed	3	2
	5. Other	0	1
VI. Do you feel you were as well prepared to advance to the next AVT unit (practice of skills, review of material) as you would have been in the regular class section?	1. Much better prepared with AVT units	2	4
	2. A little better prepared with AVT units	6	3
	3. About the same	10	10
	4. A little better prepared in the regular class	3	2
	5. Much better prepared in the regular class	3	0
	6. Not sure	2	4
VII. Do you think you will be able to apply what you learned from this course as much as you would have if you had been in the regular section?	1. Much more from the AVT section	1	3
	2. A little more from the AVT section	5	4
	3. About the same	13	10
	4. A little more from the regular section	5	2
	5. Much more from the regular section	0	0
	6. Not sure	2	4

Questions	Answers	Number of Responses Bus. Mach.	Typing
VIII. Do you think you spent as much time learning each machine by the AVT method as you would have in the regular class?	1. Much less time spent with AVT method	6	1
	2. A little less time spent with AVT method	7	4
	3. About the same	4	7
	4. A little more time than the regular class	3	3
	5. Much more time than the regular class	4	7
	6. Not sure	2	1
IX. Now that you have directly participated in the AVT section, how do you feel about this as a method of instruction?	1. I enjoyed it very much	10	8
	2. I enjoyed it somewhat	12	12
	3. I have no particular feelings about it	1	1
	4. I disliked it somewhat	3	2
	5. I disliked it very much	1	0

Questions	Answers	Number of Responses Bus. Mach.	Typing
X. To what do you attribute your feelings as indicated in Question IX? (check more than one if applicable.)	1. Adequate teacher contact	1	0
	2. Inadequate teacher contact	2	5
	3. Freedom to schedule own time	19	18
	4. Inability to "get at it" when I should	4	3
	5. Opportunity to complete lessons as fast as I wanted	12	10
	6. The carrel was not available	2	1
	7. The practice machines were not available when I needed them	1	2
	8. Other	4	4
XI. If you were to enroll in Business Machines II/Typing II and it was available by either the AVT method or the regular class method, which would be your preference?	1. The regular class	10	5
	2. The AVT section	16	17
	* Not sure		1

8. CONCLUSIONS AND RECOMMENDATIONS

The skills of business machines operation and typewriting can be more effectively learned by replacing the traditional classroom situation with the audio-visual-tutorial system described in this study. Both treatment groups, and especially the "pure" subgroups, showed significantly better performance on final exams than did their regular-class counterparts.

Students generally prefer the open-laboratory method of learning over the traditional classroom method. Although the results of the Business Machines experiment were not as indicative as those of the Typewriting experiment, it was concluded that the easier availability of machines and instructors for the latter group made the major difference in attitude.

Extended research in the area of individualized instruction by the A.V.T. method should be undertaken to consider the following problems and opportunities:

1. Further research in these subjects and in other skill and nonskill subjects should be completed in an effort to build a completely individualized curriculum.

2. Future A.V.T. courses should be first tried on an experimental basis to be sure that the educational content and quality is equal to that of traditional classes.

3. An adequate system of recording student progress and lab usage should be sought to help students maintain steady progress without enforcing rigidity.

4. Greater teacher availability should be maintained to reduce student apprehension. This could be handled effectively by qualified teaching technicians.

5. Enrollment procedures should be devised to allow prospective students to begin an A.V.T. section at any time.

6. Pre-tests should be developed which would provide background information necessary to construct a course from all available units for each individual student.

SELECTED BIBLIOGRAPHY

1. "A.V. Practices Among Colleges and Universities," American School and University, Vol. 36, July, 1964, pp. 26-27.

2. Bollmann, Charles G., "Cartridge Films: A Smoldering Revolution.", Educational Resources & Techniques, Vol. 7, No. 2 May, 1967, pp. 2-5,22.

3. Cook, Fred S., and Maliche, Eleanor, Office Machines Used In Business Education Today, Detroit: College of Education, Wayne State University, 1965.

4. Fisk, McKee, "A Business Curriculum to Meet Change," Business Education Meets the Challenge of Change, NBEA Yearbook No. 4, Washington D.C., 1967.

5. Gerlach, Vernon S., and Vergis, John P., "Self-Instructional Motion Pictures," AV Communication Review, Vol. XIII, No. 1, Spring 65.

6. Hillestad, Mildred, "Research, Experimentation and Innovation needed for Change," Business Education Meets the Challenge of Change, NBEA Yearbook No. 4, Washington D.C., 1967.

7. Poland, Robert P., "The Use of Televised Instruction in Typewriting," National Business Education Quarterly, 34 Spring, 1966, pp. 27030.

8. Rahe, Harves, "The Research in Typewriting," Business Education Forum, 19 October, 1964, pp. 17, 23.

9. Tanzman, Jack, "Some Notes on Using 8mm Magnetic Sound," Educational Screen and AV Guide, XXXX, October, 1966, p. 541.

10. Wagner, Robert W., "The Educational Film in Transition, " Audiovisual Instruction, IX, No.3, March, 1964, pp. 170-174.

11. West, Leonard J., Implications of Research for the Teaching of Typewriting, Research Bulletin No. 2, Delta Pi Epsilon, 1962.

APPENDIX A

Course Outline for Business Machines I

(All instruction provided on 8mm continuous-loop sound films)

Burroughs Key-Driven Calculator

Lesson	Subject
1	Touch addition
2	Touch addition (cont.)
3	Multiplication I
4	Multiplication II
5	Multiplication using decimals
6	Subtraction of whole numbers
7	Divison
8	Division with decimals
	Unit test

Friden Fully-Automatic Rotary Calculator

Lesson	Subject
1	Addition
2	Subtraction
3	Addition and subtraction
4	Multiplication of whole numbers and decimals
5	Semi-automatic - multiplication of whole numbers and decimals
6	Division of whole numbers
7	Division of numbers with decimals
	Unit test

Monroe Ten-Key Adding Machine

Lesson	Subject
1	Touch addition
2	Touch addition - home row, 4, 5, 6
3	Touch addition - 1, 2, 3, 0 plus combination figures
4	Subtraction
5	Multiplication of decimals
6	Short cut multiplication
7	Multiplication of fractions
	Unit test

APPENDIX B

Course Outline for Beginning Typewriting

(Indicating instructional media and practice materials)

UNIT	SUBJECT	FILM	SLIDES & TAPES	SUPPLEMENTARY *TAPES
01101	Basic Introduction Machine Parts Home Row Keys	X		
01102	New Keys Type Size & Paper Size	X		
01103	New Keys Spacing Rules Shifting for Capitals	X		
01104	New Keys Reminders	X		
01105	New Keys Shifting for Capitals	X		1-3
01106	New Keys	X		3
01107	New Keys Backspacing	X		3
01108	New Keys Spacing Rules	X		
01109	New Keys Tabulating	X		
01110	Test			

UNIT	SUBJECT	FILM	SLIDES & TAPES	SUPPLEMENTARY TAPES
01111	Paper Guide Margins Setting Tab Stops GWAM			1
01112	Speed Building			1
01113	Speed Building			1
01114	New Keys: Numbers	X		1
01115	New Keys: Numbers	X		1
01116	Machine Parts New Keys: Numbers	X		1
01117	New Keys: Numbers	X		1
01118	New Keys: Symbols Spacing Rules	X		1
01119	New Keys: Symbols Spacing Rules	X		1
01120	New Keys: Symbols Spacing Rules	X		1-2
01121	New Keys: Symbols Spacing Rules	X		1-2
01122	New Keys: Symbols Spacing Rules	X		1-2
01123	Test			

UNIT	SUBJECT	FILM	SLIDES & TAPES	SUPPLEMENTARY TAPES
01124	Memorandum		X	1
01125	Horizontal Centering Spread Titles	X		1
01126	Proofreaders Marks			1
01127	Personal Note		X	1
01128	Postal Cards		X	1
01129	Vertical Centering		X	1
01130	Personal Letter		X	1
01131	Small Envelopes Folding Letters		X	1
01132	Themes		X	LT
01133	Business Letters		X	1
01134	Test			
01135	Erasing		X	1
01136	Tabulation		X	1
01137	Word Division			1
01138	Carbons	X		1
01139	Outlines		X	1

UNIT	SUBJECT	FILM	SLIDES & TAPES	SUPPLEMENTARY TAPES
01140	Unbound Manuscript		X	1
01141	Bound Manuscript		X	1
01142	Footnotes		X	
01143	Final Examination		X	LT

*1 - Skill Building Tape

2 - Production Typikng Tape

3 - Typing from Dictation Tape

LT - Lab Technician Gives 2 3-Minute Writings

APPENDIX C

SPONSORS, PRINCIPLE INVESTIGATORS, COOPERATING AGENCIES

Sponsoring Agencies:

The Division of Vocational Education, Department of Education, Lansing provided out-of-pocket funds of $9,445 for this project. Through released time and additional expenses Lansing Community College expended $18,181.33. Expenses are itemized as follows:

Project Director (released time)	$8212.00
Project Assistants (released time)	5200.00
Clerical	1412.00
Carrels (including equipment)	4821.50
Filmed Units	5501.33
Slide and Taped Units	1217.59
Supplies and Miscellaneous	1361.91
	$27,626.33

Principle Investigators:

Director - Ronald K. Edwards, Associate Professor and Chairman, Accounting and Office Programs

Assistants - Mildred Williams, Associate Professor Accounting and Office Programs

Wanda Roderick, Assistant Professor Accounting and Office Programs

Cooperating Agencies:

Instructional Media Center, Lansing Community College

Instructional Materials Center, Michigan State University

Mathematics Department, Lansing Community College (for statistical assistance)

Accounting and Office Programs Students, Lansing Community College

APPENDIX D

A. V. T. Student Opinionnaire

Read each statement carefully. Select the alternative for each that most nearly represents your own opinion or feelings. Indicate your choice with a check mark in the space provided.

I. A. Age: 17-19 _____, 20-22 _____, 23-25 _____, over 25 _____.
B. Sex M _____ F _____

II. A. No. of Credits at L. C. C. prior to this term _____
B. No. of College Credits other than L. C. C. _____ Term hours
_____ Semester hours
C. No. of credits this term _____

III. Do you think you learned as much in the A. V. T. section as you would have if you had been in the regular section?

_____ 1. Much more in the A. V. T. section
_____ 2. A little more in the A. V. T. section
_____ 3. About the same
_____ 4. A little more in the regular class
_____ 5. Much more in the regular class
_____ 6. Not sure

IV. In addition to the A.V.T. unit instruction, approximately how many times did you have need for specific help with practice problems?

_____ 1. More than 10 times
_____ 2. About 6 through 10 times
_____ 3. About 3 to 5 times
_____ 4. About 1 to 3 times
_____ 5. Not at all

V. When specific help was needed, whom did you ask for it? (Check more than one if applicable)

_____ 1. The instructor
_____ 2. The lab technician
_____ 3. Classmates
_____ 4. No help needed
_____ 5. Other

VI. Do you feel you were as well prepared to advance to the next A. V. T. unit (practice of skills, review of material) as you would have been in the regular class section?

_____ 1. Much better prepared with A. V. T. units
_____ 2. A little better prepared with A. V. T. units
_____ 3. About the same
_____ 4. A little better prepared in the regular class
_____ 5. Much better prepared in the regular class
_____ 6. Not sure

VII. Do you think you will be able to apply what you learned from this course as much as you would have if you had been in the regular section?

_____1. Much more from the A.V.T. section
_____2. A little more from the A.V.T. section
_____3. About the same
_____4. A little more from the regular section
_____5. Much more from the regular section
_____6. Not sure

VIII. Do you think you spent as much time learning to type by the A.V.T. method as you would have in the regular class?

_____1. Much less time spent with A.V.T. method
_____2. A little less time spent with A.V.T. method
_____3. About the same
_____4. A little more time than the regular class
_____5. Much more time than the regular class
_____6. Not sure

IX. Now that you have directly participated in the A.V.T. section, how to you feel about this as a method of instruction?

_____1. I enjoyed it very much
_____2. I enjoyed it somewhat
_____3. I have no particular feelings about it
_____4. I disliked it somewhat
_____5. I disliked it very much

X. To what do you attribute your feelings as indicated in Question IX? (Check more than one if applicable.)

_____1. Adequate teacher contact
_____2. Inadequate teacher contact
_____3. Freedom to schedule own time
_____4. Inability to "get at it" when I should
_____5. Opportunity to complete lessons as fast as I wanted
_____6. The carrel was not available when I needed it.
_____7. The practice machines were not available when I needed them
_____8. Other (please specify)_____
_____9. _____

XI. If you were to enroll in Typing II and it was available by either the A.V.T. method or the regular class method, which would be your preference?

_____1. The regular class
Reason:

_____2. The A.V.T. section
Reason:

XII. What would be your suggestions for improving this course on A.V.T. media?